Shravan Godse

(+1) 412-654-0388 ✉ sgodse@andrew.cmu.edu LinkedIn Google Scholar Homepage

Education

Carnegie Mellon University *August '22 - Present*
PhD Candidate, Mechanical Engineering **GPA: 4.0/4.0**

Indian Institute of Technology, Bombay *July '18 - May '22*
B.Tech. (with honors) in Mechanical Engineering and a minor in Management **CPI: 9.02/10.00**

Research Experience

The Malen Laboratory | *PhD Candidate* | Prof. Jonathan Malen (CMU) *August '23 - Present*

- In a collaborative project, working on understanding thermal transport in polymers with an aim of developing and characterizing **thermally conductive polymers** for light weight heat exchangers and flexible electronics
- Employing laser-based technique of **Frequency Domain Thermoreflectance** (FDTR) and **Transient Hot Wire** (THW) to characterize thermal conductivity of thin film and bulk polymers

EEG Lab | *Graduate Researcher* | Prof. Venkat Viswanathan (CMU) *August '22 - August '23*

- Worked on anionic redox in **Lithium-ion** batteries by simulating Li-rich transition metal oxide cathodes using density functional theory, equvariant graph neural network models and Monte Carlo simulations.

Materials Research Lab | *Undergraduate Researcher* | Prof. Ankit Jain (IIT Bombay) *July '20 - May '22*

- Investigated thermal conductivities of type-I clathrates: $X_8Ga_{16}Ge_{30}$ (X: Sr/Ba), with potential applications in **thermoelectricity**, using first principles methods on the SpaceTime **supercomputing** facility
- Trained a neural network to predict formation energies of Al-Si-Mg alloys with a MAE of **0.02 eV/atom**

TheoFEM Lab | *Summer Research Internship* | Prof. David Egger (TU Munich) *May '21 - August '21*

- Simulated infrared and **Raman spectra** of $FAPbBr_3$ – a hybrid organic-inorganic perovskite with promising applications in **solar cell** technologies, using VASP and PhonoPy-SpectroscoPy python packages

Publications

S. Godse, Y. Srivastava, A. Jain, "*Anharmonic lattice dynamics and thermal transport in type-I inorganic clathrates*", Journal of Physics: Condensed Matter, 34 145701 (2022)

G. Reuveni, Y. Diskin-Posner, C. Gehrmann, **S. Godse**, et. al. "*Static and Dynamic Disorder in Formamidinium Lead Bromide Single Crystals*", The Journal of Physical Chemistry Letters, 14, 5, 1288-1293 (2023)

Industry Experience

Research Intern | **QPiVolta Technologies Pvt. Ltd.** *January '22 - April '22*

- Compiled and containerized **GPU**-version of Quantum Espresso on **Amazon Web Services** using **Docker**
- Developed a **Python interface** for accelerating ab-inito molecular simulations through **active learning** using graph neural network models on the Open Catalyst Project

Advance Engineering Intern | **Varroc Engineering Ltd.** *December '19*

- Performed extensive literature survey on charging strategies for **Lithium-ion batteries** such as Constant Current-Constant Voltage (CC-CV), Multistage, Pulsed and Fuzzy Control based charging
- Modeled CC-CV and Multistage charging in **MATLAB & Simulink** to compare for an optimal charging profile

Academic Projects

Data-driven Inverse Airfoil Design | *Bayesian Machine Learning* (CMU) *Spring '22*

- Trained an **autoencoder** and created a pipeline for **inverse design** of airfoils with desired lift-drag properties

Optimizing Formula1 Racing Line | *Numerical Methods* (CMU) *Spring '22*

- Employed the **differentiable** PyTorch framework to optimize F1 raceline using **gradient descent** algorithm

Manhole Cleaning Solutions | *Machine Design* (IIT Bombay) *Fall '22*

- Spearheaded a **team of 8** and developed solutions to alleviate the issue of **manual scavenging** in India by designing machines such as **Archimedes screw** and automatic robots in **Fusion 360** and **ADAMS** software

Schrodinger-Poisson Solver | *Physics of Nanoelectronic Devices* (IIT Bombay) *Autumn '20*

- Obtained **99.64%** accuracy with **1/10th** computational resources upon solving Schrodinger equation using the technique of **non-uniform meshing** by Tan et al. for a finite quantum well using **Python**

Extracurricular Achievements

- Awarded **Narotam Sekhsaria Scholarship** for excellent overall performance at IIT Bombay
- Awarded **Undergraduate Research Award** for contributions to research in lattice dynamics
- Recipient of the prestigious **Kishore Vaigyanik Protsahan Yojana (KVPY) scholarship**, a national fellowship awarded by Dept. of Science & Technology, Government of India for students with an aptitude in research